

ON THE GENUS *BEMISIA* (FAMILY ALEYRODIDAE)
FOUND IN JAPAN, WITH DESCRIPTION
OF A NEW SPECIES

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THREE FIGURES AND ONE PLATE

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The genus *Bemisia* known to occur in Japan, is represented by three species; *giffardi*, *shinanoensis*, and one new species. They are all of more or less economic importance, especially the last two forms which attack cultivated mulberry trees and cause considerable damage to the silk industry in some parts of the empire.

The three known species from Japan may be separated by the following key :

Key for separation of species.

- A. Pupa case elliptical in outline; dorsum with two distinct longitudinal ridges which bear prominent spines
. *giffardi* Kotinsky
- B. Pupa case oval in outline; dorsum with longitudinal ridges,
 - (i) Dorsum with prominent spines; submarginal area with no spines *shinanoensis* Kuw.
 - (ii) Dorsum without prominent spines submarginal area with prominent spines *myricae* n. sp.

1. *Bemisia giffardi* (Kotinsky)

(Nom. Jap. Hime-konajirami)

1907 *Aleyrodes giffardi* Kotin.; Div. Ent. Bd. Comm. Agr. and Forestry Hawaii, Bull. no 2 p. 94.

Pupa case: Length 1.17–1.41 mm., width 0.51–0.70 mm. On the leaf the pupa case is pale greenish yellow in color with purplish eyes; vasiform orifice dark brown. Empty case white, transparent. In shape the case is elliptical, slightly convex, rectangular area between longitudinal ridges, head and vasiform orifice somewhat convex. Ridges are about one-third the distance from the medio-dorsal line, which is keeled and crossed by the sutures between the segments. Dorsum covered with a very thin transparent exudation.

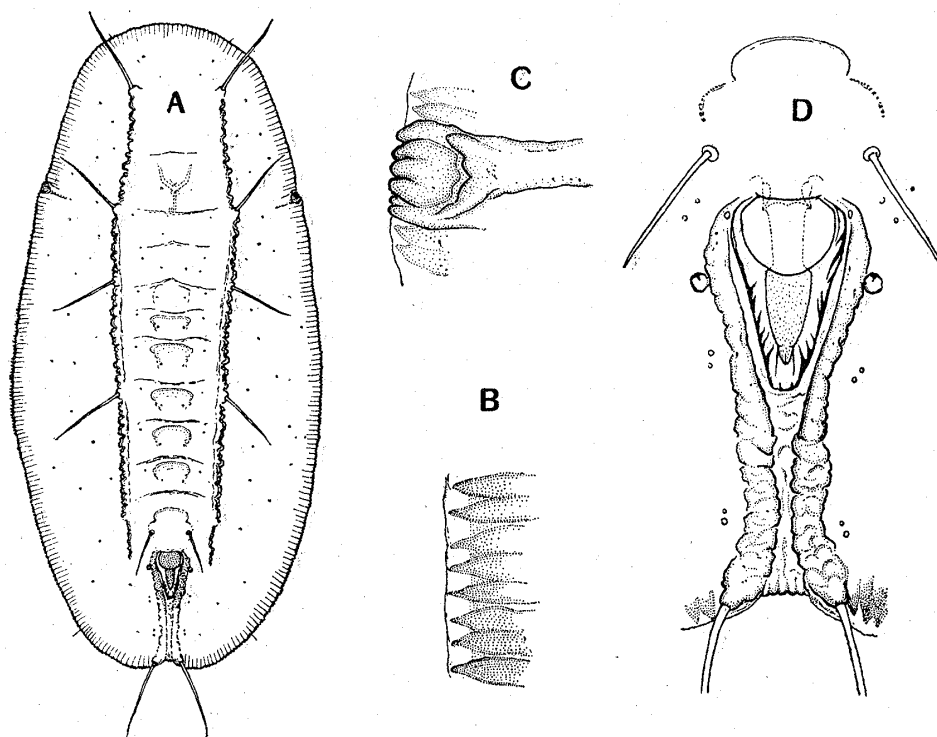


Fig. 1 *Bemisia giffardi*

A. Pupa case; B. Margin of pupa case; C. Thoracic tracheal pore or comb of pupa case; D. Vasiform orifice of pupa case.
(all figures, more or less magnified)

Four prominent spines arise from tubercles on each side of the medio-dorsal line, one in front of each eye, two on the thorax, and one on the abdomen, a pair of spines anterior to the vasiform orifice; one prominent spine on each side of the caudal cleft. On both posterior lateral margin and cephalothorax each with a pair of

inconspicuous hairs. Margin evenly crenate, comb of the thoracic folds noticeable.

Vasiform orifice elongate triangular with rounded angles; inner lateral margin crenate; outwardly lined on each side by a band of chitin, which extend to caudal extremity. Operculum very small lunar in outline, finely punctate. Lingula club-shaped, about four-fifths the length of the orifice, minutely punctate, with a small knob at the apex; a brush of hair or spines extends upward toward the apical end of the lingula; a pair of rather long spines near apical end of lingula.

Habitat: On under side of leaves of citrus plants, common in and about Shizuoka city.

Remarks: This species was first found in Hawaii on citrus plants and described by Mr. J. Kotinsky in 1907. It was found in Japan in 1908, on citrus plants in Okabe town, near Shizuoka city, it is also known to occur in India.

In the original description of Kotinsky it is stated that there is no exudation whatever either lateral or dorsal, however the present writer has noted that there is a thin transparent waxy secretion which is not extended beyond the margin of the case.

2. *Bemisia shinanoensis* Kuw.

(Nom. Jap. Shinano-konajirami)

1922 *Bemisia shinanoensis* Kuw.; Journal of Plant Protection, Vol. 9, no. 9, p. 464.

Pupa case: Length 0.986–1.280 mm., width 0.714–0.970 mm. Oval in outline. Pale yellow in color. Dorsum slightly convex, margin flat, not separated from dorsal area. The margin armed with a series of minute teeth divisions from which suture-like markings extend mesal on the case. The teeth on the thoracic tracheal regions are very prominent. On the central dorsal area, that part immediately above the developing adult, the segments of the body are distinctly marked. On the each side of the dorsal area there is a row of spines, two on each side of the thorax and one on each side of the abdomen, those on the abdomen are somewhat smaller. On the median area of the dorsum there are the following spines: one

pair in about the middle of the thorax, one pair on the first abdominal segment, and one pair just cephalad of the vasiform orifice, which is somewhat smaller than the others. A short, stout spine

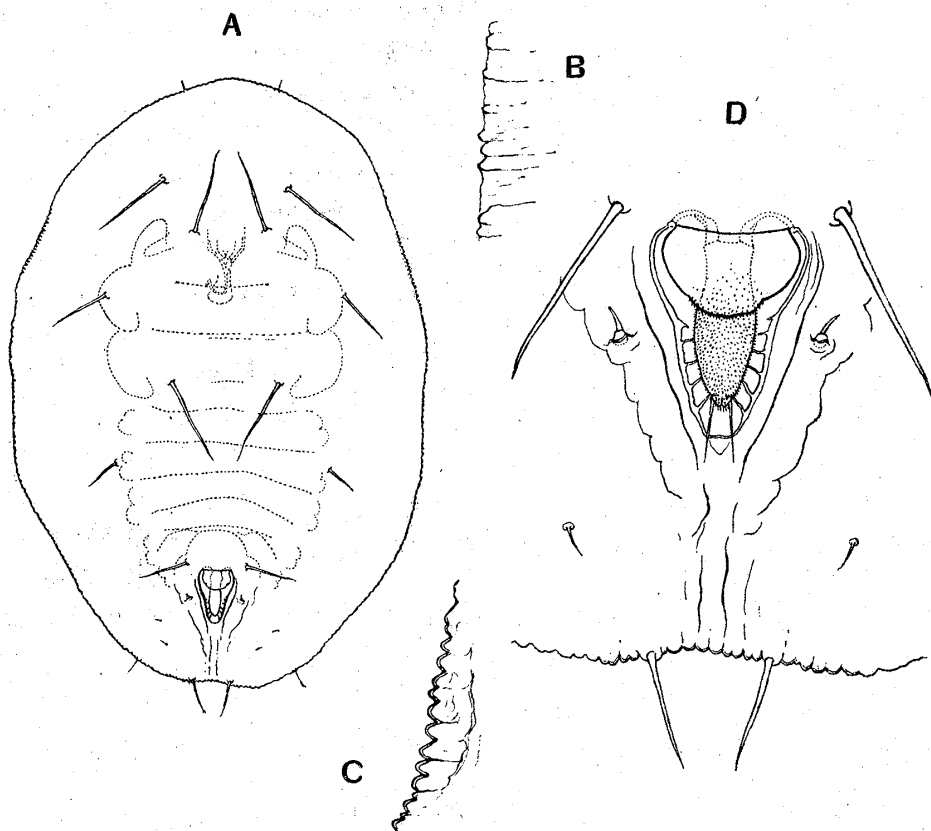


Fig. 2 *Bemisia shinanoensis*.

A. Pupa case; B. Margin of pupa case; C. Margin of thoracic tracheal area of pupa case; D. Vasiform orifice of pupa case.
(all figures, more or less magnified)

on each side of the vasiform orifice. Each side of the caudal cleft is armed with a rather short spine. A pair of fine hairs on the anterior and posterior regions.

Vasiform orifice triangular, much longer than broad, its inner caudal margin armed with a number of sharp tooth-like projections. Operculum short, heart-shaped, not extending more than one-third the distance to the caudal extremity of the orifice. Lingula elongate, swollen toward the distal end, setose, its tip quite visible caudad of the operculum.

Habitat: On cultivated mulberry, *Morus alba* (Kuwa), found in Nagano-ken (Shinano prefecture), collected for the first time by Mr. J. Murata in October 1920.

Remarks: It appears to the writer as unnatural not finding the winter host of this species. So far as known to the writer this species of whitefly passes the winter in the full grown larval or pupa stage on dead mulberry leaves on the ground.

3. *Bemisia myricae* n. sp.

(Nom. Jap. Yamamomo no konajirami)

(Pl. 1)

Pupa case: Length about 0.8mm., width 0.6mm. Oval in outline, as seen on the leaf under a hand lens, the dorsum is slightly

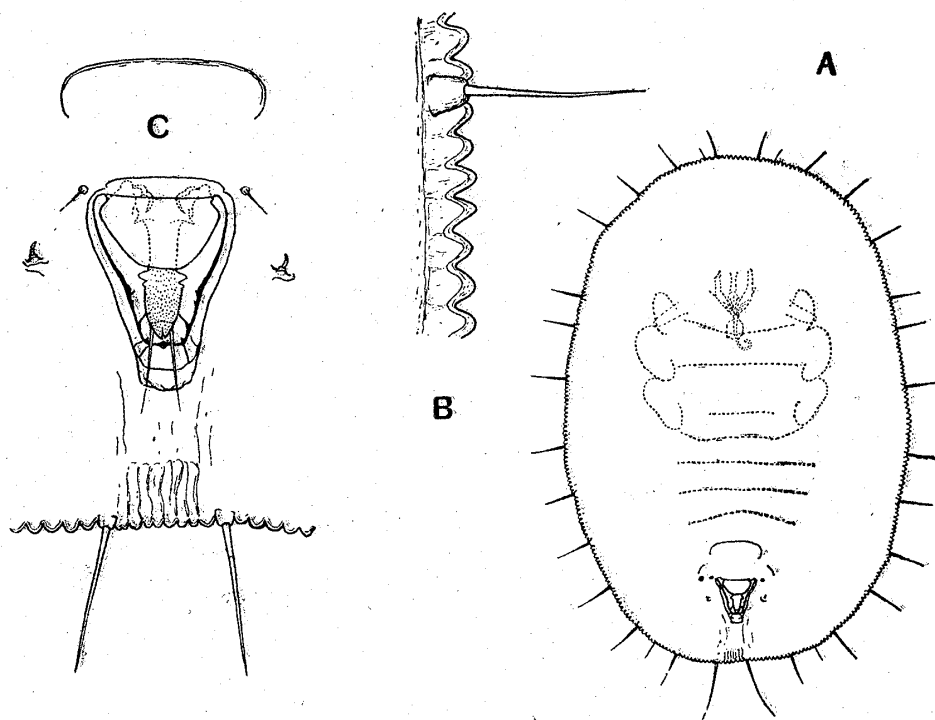


Fig. 3 *Bemisia myricae*

A. Pupa case; B. Margin of pupa case; C. Vasiform orifice of pupa case.

(all figures, more or less magnified)

convex, thinly covered with a layer of transparent waxy secretion, through which the body segments may be faintly discerned; extending from the margin of case all around is a fringe of transparent waxy secretion. Color of fresh pupa case very pale greenish yellow with eyes purplish red. The empty case is colorless.

Under the microscope the color is pale yellow. Rudimentary feet on ventral surface quite distinct. The margin of the case is distinctly and uniformly crenated. No demarkation between margin and dorsal disk. Submarginal area armed all round with a series of rather long and slender tubercled spines, about thirty two in all or sixteen on each side. On both posterior lateral margin and cephalothorax a pair of inconspicuous hairs. Two spur-like spines one on each side of the vasiform orifice, and a pair of fine spines above the orifice.

Vasiform orifice subtriangular, about three-fourths as side as long, cephalic and lateral margins forming nearly a straight line; lateral margin with corrugations or folds, extending downward and inward at the caudal end of the orifice, where there is a decided loop of the rim, the orifice thus opening into a furrow which extends caudad to margin of case, between the two tubercled spines. Operculum subequal in shape, about three-fourths as long as wide and not quite half the length of the orifice. Lingula about five-sixths the length of the orifice, the distal two-fifths enlarged, and arrow-shaped, thickly setose, and terminating in two straight spines, which reach quite to caudal end of orifice.

Habitat: On both sides of leaves of *Myrica rubra* (Yamamomo), *Morus alba* (Kuwa), *Citrus* spp. (Kankitsu rui) and some other plants. Found in Kochi, Wakayama and Aichi Ken.

Remarks: This new insect is allied to *B. shinanoensis* Kuw. but slightly smaller and the submargin of the pupa case is armed with prominent spines, but no spines on the dorsum, while *B. shinanoensis* bears no spines on the submargin, and several prominent spines on the dorsum.

This species of whitefly passes the winter on leaves of *Myrica*

rubra and *Citrus* spp. in the immature stage. About latter part of May in the following year it becomes mature and flies away to new mulberry fields and propagate there during the summer months, toward the fall, before the mulberry leaves fall off it comes back to the winter hosts. It is not uncommon to see it attacks other deciduous plants during the summer months.

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PLATE 1

EXPLANATION OF FIGURES

- 1 Mulberry leaf with *Benisia myricae*.
- 2 Part of the same (greatly magnified).

THE GENUS BEMISIA
INOKICHI KUWANA

PLATE 1

